CLAIMS

1. A process for forming an insulating film on the surface of a substrate for electronic device, comprising at least two steps of regulating the characteristic of the insulating film,

wherein the at least two steps of regulating the characteristic of the insulating film are conducted under the same operation principle.

2. A process for forming an insulating film according to claim 1, wherein the steps conducted under the same operation principle are two or more steps selected from the group consisting of: cleaning, oxidation, nitriding, and etching of the substrate surface and/or the insulating film.

3. A process for forming an insulating film according to claim 1 or 2, wherein the substrate for an electronic device is a semiconductor material.

4. A process for forming an insulating film according to any of claims 1 to 3, wherein the substrate for an electronic device is a substrate mainly comprising single-crystal silicon.

5. A process for forming an insulating film according to any of claims 1 to 4, wherein the operation principle involves plasma based on a process gas comprising at least a rare gas.

6. A process for forming an insulating film according to claim 5, wherein the plasma is plasma based on microwave irradiation through a plane antenna member (RLSA).

7. A process for forming an insulating film according to any of claims 1 to 6, wherein the process comprises a step of cleaning, and the cleaning step comprises treatment based on plasma based on a process gas comprising at least a rare gas.

8. A process for forming an insulating film according to claim 7, wherein the step of cleaning comprises plasma treatment based on a process gas

comprising at least a rare gas and hydrogen gas.

9. A process for forming an insulating film according to any of claims 1 to 8, wherein the process comprises a step of oxidation and the oxidation step comprises plasma treatment based on a process gas comprising at least a rare gas and oxygen.

10. A process for forming an insulating film according to any of claims 1 to 9, wherein the process comprises a step of nitriding and the nitriding step comprises plasma treatment based on a process gas comprising at least a rare gas and nitrogen.

11. A process for forming an insulating film according to any of claims 1 to 9, wherein the process comprises a step of etching and the etching step comprises plasma treatment based on a process gas comprising at least a rare gas and hydrogen.

12. A process for forming an insulating film according to claim 2, wherein two or more steps selected from the group consisting of: cleaning, oxidation, nitriding, and etching of the substrate surface and/or the insulating film are conducted in the same vessel.

13. A process for forming an insulating film according to any of claims 1 to 12, wherein the insulating film formed by the process is used as a underlying or base insulating film for a CVD (chemical vapor deposition) insulating film.

14. A process for forming an insulating film according to any of claims 1 to 13, wherein the insulating film contains a high-k (high dielectric constant) material.

15. A process for forming an insulating film according to claim 2, wherein two or more steps selected from the group consisting of: cleaning, oxidation, nitriding, and etching of the substrate surface and/or the insulating film are conducted while avoiding the exposure of the substrate surface and/or the insulating film to the air (release thereof into the air).